

Revision of the Australian Tiphid Genus *Leiothynnus* (Hymenoptera: Tiphidae: Thynninae)

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Abstract.—The Australian thynnine genus *Leiothynnus* Turner is revised, describing five new species from Queensland, including *cardalae*, *ferricolus*, *linnis*, *multimaculatus* and *ochrotarsus*, and two previously described species, *mackayensis* (Turner) and *spinigerus* Turner, also from Queensland. Distribution maps of species and a key to males are given.

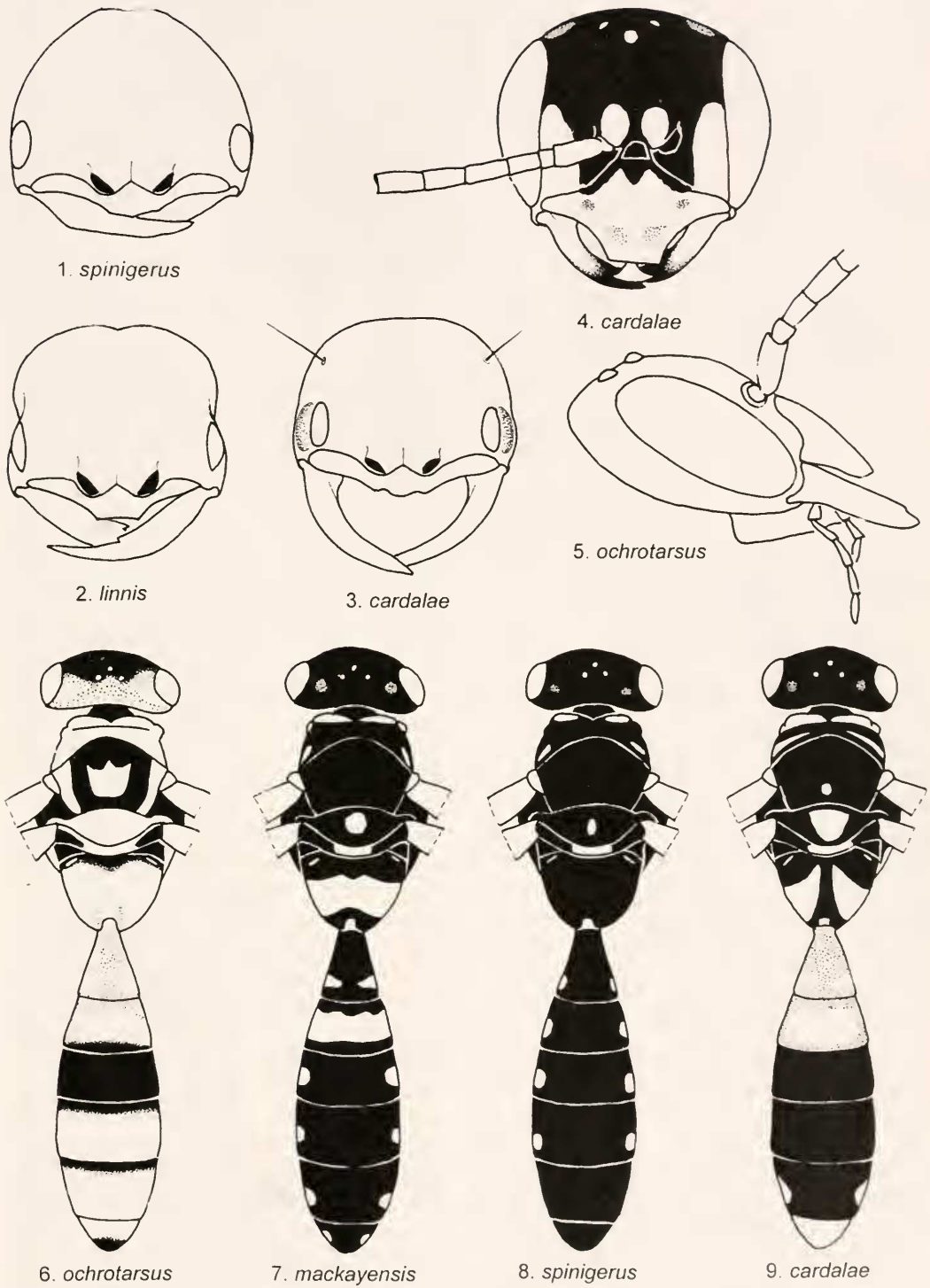
Most Australian genera of Thynninae are widespread, occurring in many Australian states, with some even extending up into New Guinea, New Caledonia and adjacent islands. However, there are some small genera with relatively restricted distributions, such as *Oncorhinothynnus*, which is only found in west central Western Australia, or *Gymnothynnus* Turner, from Northern Territory and western Queensland. The genus *Leiothynnus* Turner is one of these relatively localized groups. All *Leiothynnus* species have been collected from eastern Queensland. In addition to the two described species, *mackayensis* (Turner) and *spinigerus* Turner, there are five new ones, which are described below.

The specific relationships between *Leiothynnus* and other thynnine genera are not fully resolved. *Leiothynnus* shares a number of features with *Isvaroides* Ashmead and *Epactiothynnus* Turner, including in the male the well-developed and somewhat arcuate penis valves, volsella U-shaped in cross-section, stipes arcuate with long marginal fringe of setae, vertex with small reddish spot behind the dorsal eye margin, and a large oral plate. In the female, the pygidium has two submedial longitudinal carinae, subtended by a long tuft of setae. A few characters are shared

with *Agriomyia* Guérin de Meneville, including the flat male face (Fig. 5), with extreme reduction of the antennal lobes, and simple male epipygium, lacking the well-developed transverse carina or ridge typical of *Epactiothynnus* and related genera. However, remnants of this ridge can be seen, particularly in *cardalae* and *ochrotarsus*. *Leiothynnus* can be distinguished from these and other genera by the long brush of setae on the base of the male prementum, the darkly stained marginal cell in the forewing, and slender, petiolate male abdomen.

Leiothynnus species differ from one another in modifications of the male legs, abdominal apex and to some extent color. All of the species treated below have the male thorax with dense, nearly contiguous punctation, and the propodeal punctation obscured by fine shagreening. These features may or may not be significant at the species level. Collecting seems to be too patchy to say whether or not there are additional undescribed species. Too few females have been collected to generalize about diagnostic features among the species in females, although there appear to be differences in the overall shape of the head and development of carinae or lobes on abdominal segment V.

Specimens were obtained from the fol-



Figs. 1-9. *Leiothynnus* species. 1-3, Front view of female face, antennae removed. 4, Front view of male face, right antenna removed. 5, lateral view of male face. 6-9, Dorsal view of male body showing color pattern, white = yellow, black = black, stippled = orange to red; wings removed.

lowing institutions and individuals: The Australian National Insect Collection, CSIRO, Canberra, ACT, J. Cardale (CANBERRA); the Natural History Museum, London, England, S. Lewis; Queensland Museum, Brisbane, Australia, C. Burwell (BRISBANE-QM), and University of Queensland, Insect Collection, Brisbane, Australia, G. Daniels (BRISBANE-UQIC). Some paratypes will be deposited in the Bohart Museum of Entomology, University of California, Davis (DAVIS). The types of both previously described species were studied.

Leiothynnus cardalae Kimsey, new species

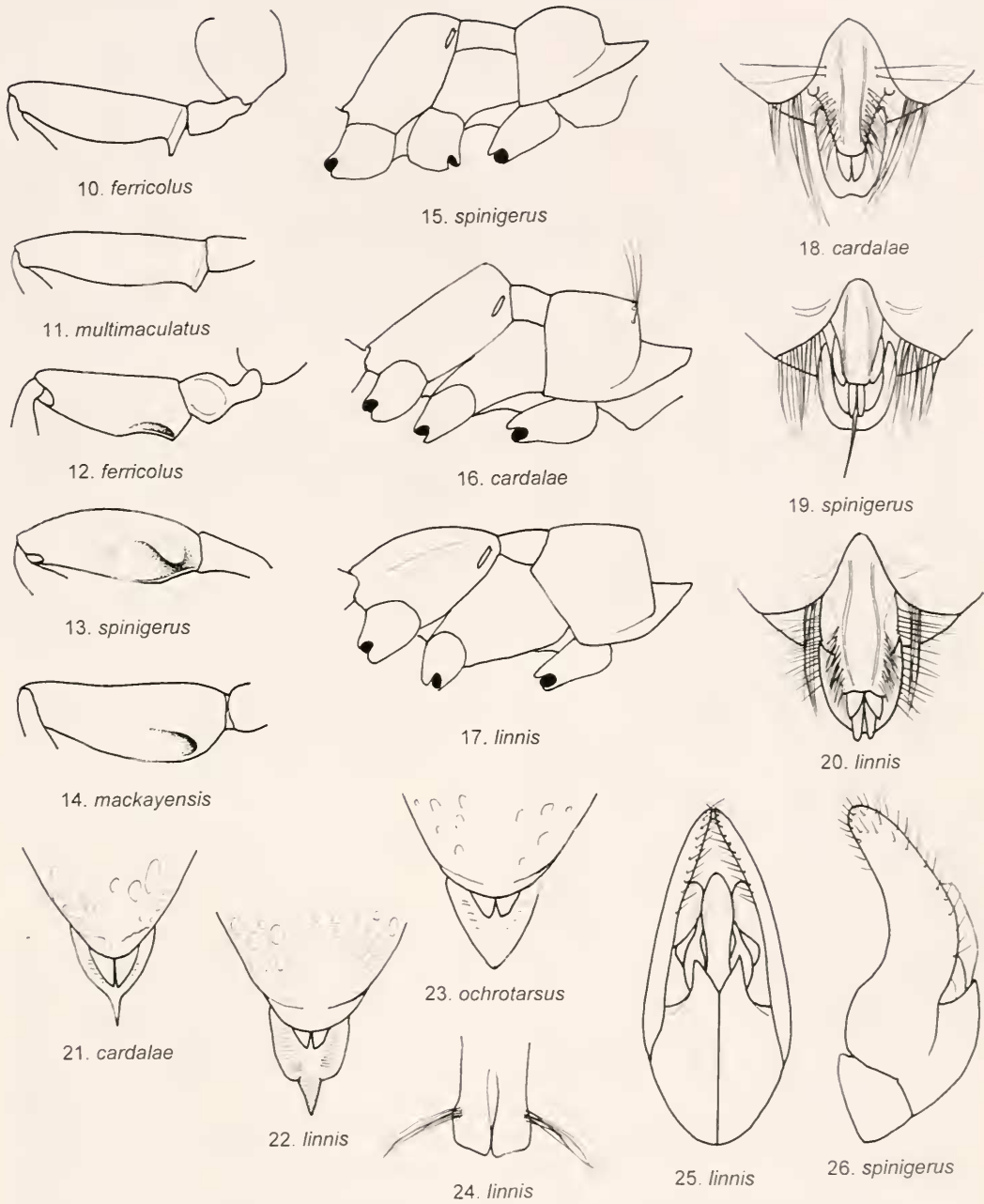
(Figs. 3, 4, 9, 16, 18, 21, 27)

Male.—Body length 7.5 mm. *Head*: face (Fig. 4) with dense small, nearly contiguous punctures; flagellomere I length $1.5\times$ breadth; flagellomeres II-III $2.5\times$ as long as broad. *Thorax*: punctures dense and nearly contiguous; propodeal punctures obscured by fine dense shagreening; scrobal sulcus strongly U-shaped, ventral loop sharply defined; foretrochanter convex in cross section; forefemur evenly convex basally, without carina, knob or other modification; midtrochanter and femur unmodified; midcoxal inner margin narrowly rounded, not angulate. *Abdomen*: hypopygial apex broadly rounded with short medial projection (projection often weakly sclerotized or translucent in some individuals) (Fig. 21). *Genitalia*: paramere arcuate, broadly rounded apically, broadest subapically (as in Figs. 25, 26). *Color* (Fig. 9): body black, with yellow and orange markings: head black with yellow clypeus, yellow along inner eye margin, between and across antennal lobes; scape pedicel and flagellomeres I-V red; rest of flagellum dark brown; pronotum black with yellow transverse anterior and marginal posterior bands; mesopleuron with subalar yellow spot and large yellow spot above midcoxa; one specimen with small yellow scutal spot; scutellum and metanotum with large

medial yellow spot; propodeum with large lateral yellow marks, narrowly separated medially; trochanter and femora reddish brown, femoral apices sometimes paler, tibiae red, tarsi yellow to cream-colored; tergum I orange with transverse subapical yellow band, narrowed medially; tergum II yellow with narrow dark brown bands along anterior and posterior margins; tergum III-IV entirely black; tergum V-VI yellow anteriorly with narrow blackish posterior band, or black with yellow lateral spot; tergum VII dark brown to black; sternum I blackish basally, orange apically with yellowish middle; sternum II orange; sterna III-VI black.

Female.—Body length 4 mm. *Head* (Fig. 3): broader than long, vertex somewhat concave, with long seta above each eye; genal area above mandible with carina extending the length of eye. *Thorax* (Fig. 16): pronotal disk abruptly elevated above collar, disk with longitudinal medial sulcus, anterior margin with six long hairs; scutellum about twice as broad as long, propodeum strongly convex dorsally and elevated above scutellum, bulging medially and flattened sublaterally, medial bulge with long erect hairs. *Abdomen*: tergum I with broadly W-shaped transverse sulcus; tergum II with four large transverse ridges; tergum V apicomediaally emarginate; tergum VI with narrow parallel-sided carina-edged medial plate, apically subtended by short dense tuft of setae (Fig. 18); sternum VI apicomediaally emarginate and thin-edged, with long brush of setae laterally and shorter brush apicomediaally. *Color*: dark reddish brown.

Type material.—Holotype δ : Queensland, Luster Creek, 8 km nw Mt. Molloy, 21–22 May 1980, I. Naumann and J. Cardale (CANBERRA). Seven paratypes—3 $\delta\delta$: Mt. Webb National Park, 15.04°S 145.07°E , 20–27 April 1981, I. Naumann; 1 δ , one η : Shipton's Flat, 15.47°S 145.07°E , 16–18 May 1981, I. Naumann; 1 δ : Coen, 13.57°S 143.12°E , 13 Jan.–25 Feb. 1994, malaise trap, Zborowski and McKay; 1 δ : Tol-



Figs. 10–26. *Leiothynnus* Figs. 10, 11, Lateral view of male forefemur and trochanter. 12–14, Lateral view of inner surface of male forefemur and trochanter. 15–17, Lateral view of female thorax, legs removed. 18–20, Posterior view of female pygidium. 21–23, Dorsal view of male epipygium and hypopygium. 24, Ventral view of female apical abdominal sternum. 25, Dorsal view of male genital capsule. 26, Lateral view of male genital capsule.

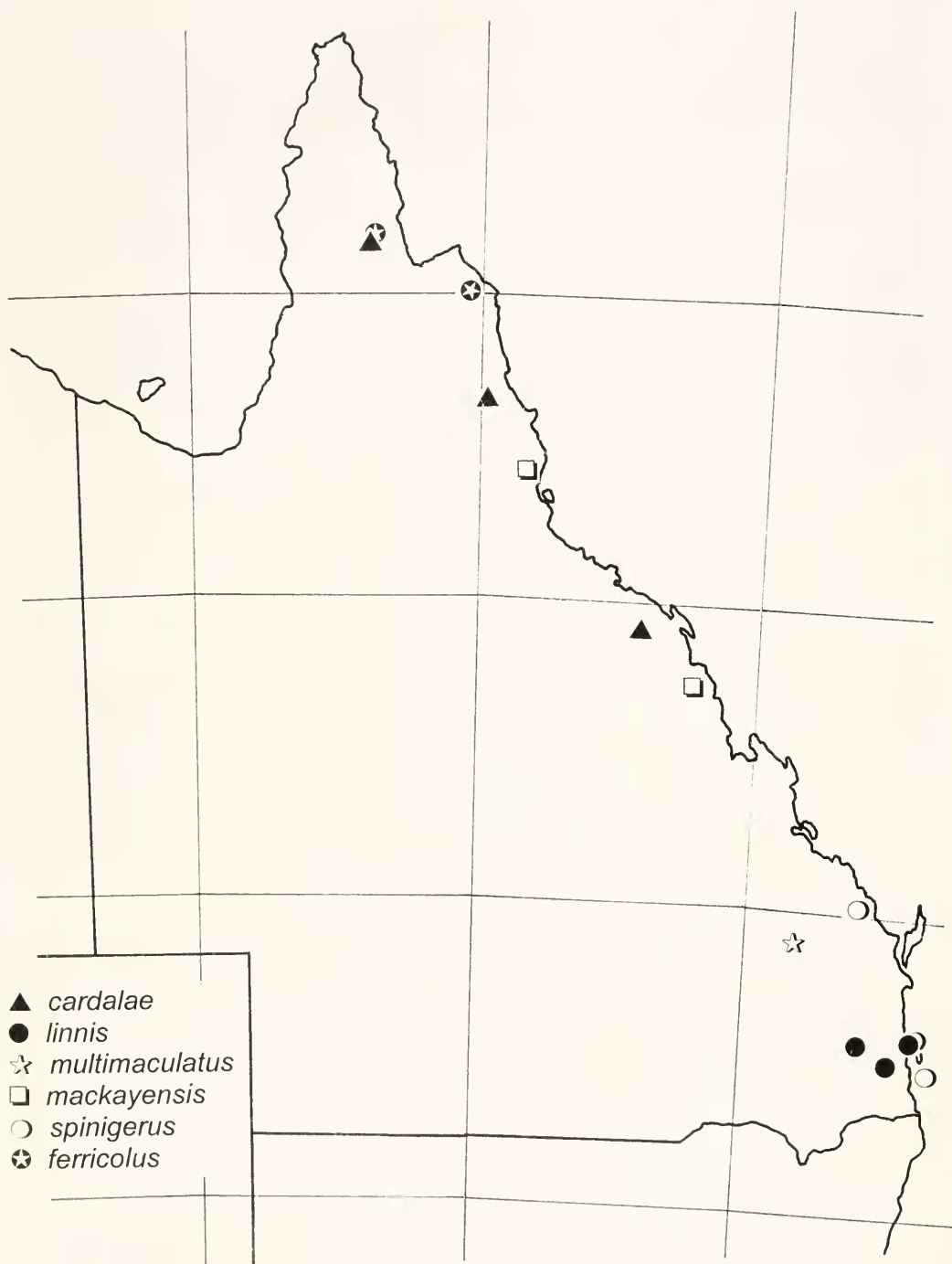


Fig. 27. Distribution map of six species of *Leiothynnus* in Australia.

ga, 3 Mar. 1964, R. Elder (BRISBANE-UQIC, CANBERRA, DAVIS).

Distribution.—Fig. 27.

Etymology.—This species is named in honor of Jo Cardale, who was one of the collectors of the holotype specimen. She also made much of this study possible, with collections support and encouragement overall.

Discussion.—*Leiothynnus cardalae* is a brightly colored species in the male, characterized by having a reddish brown to orange petiole. This coloration is shared with *ferricolus* and *multimaculatus*. Male *cardalae* can be distinguished by the unmodified fore- and midfemur (a characteristic shared with *ochrotarsus*), red legs and bicolored antenna. The female of *cardalae* has the least modified head of species where females are known. The female thorax is distinctive with a sparse row of long hairs along the anterior margin of the pronotum, strongly dorsally arched propodeum, and pygidium with lateral carinae parallel or converging slightly submedially, with a small lateral lobe on tergum VI.

***Leiothynnus ferricolus* Kimsey, new species**

(Figs. 10, 12, 27)

Male.—Body length 7.5–8.0 mm; punctuation as in *cardalae*. *Head*: flagellomere II 2.5× as long as broad; flagellomere III length 3× breadth. *Thorax*: scrobal sulcus with ventral loop poorly defined; foretrochanter strongly flattened and concave (Fig. 12); forefemur with short basoventral longitudinal carina, basolateral angle expanded and flattened ventrally (Fig. 12); midfemur with long basoventral tooth, tooth nearly as long as tarsal claw (Fig. 10), adjacent surface of trochanter flattened; midcoxa inner margin sharp-edged and angulate. *Abdomen*: hypopygial apex angulate laterally with long medial projection. *Genitalia*: as in Figs. 25, 26. *Color*: black with yellow and orange markings; clypeus yellow, interantennal area

yellow; inner eye margin with broad yellow stripe; mandible red with basal yellow spot; pronotum with broad transverse yellow anterior and posterior stripes; mesopleuron with large yellow subalar and supracoxal spots; scutellum and metanotum with large yellow medial spot; propodeum with large lateral yellow spots, narrowly separated medially; hindcoxa with yellow dorsal spot; trochanter and femora dark brown, femoral apices sometimes paler, orange; fore and midtibiae orange; hindtibia dark brown or orange; tarsi yellowish brown; wing membrane yellow stained; abdominal segment I black basally, becoming orange for most of length, with transverse yellow band or yellow spots; tergum II brown basally and apically with broad medially yellow band; sternum II brown with small lateral yellow spot; terga III, and in most specimens IV, black with small lateral yellow spot; terga V–VI black with large lateral yellow spot, spots sometimes convergent medially; tergum VII black to dark brown; sternum III–VII black.

Female.—Unknown.

Type material.—Holotype ♂: Queensland, Cape York Peninsula, Iron Range, Apr. 7–May 4, 1973, S. R. Monteith (CANBERRA). Nine paratype ♂♂: same data as holotype; 1 ♂: McIlwraith Range, 8 km ne Coen, 13°53.30S 143°15.21E, 13 Jan. 1994, G. & A. Daniels and R. Eastwood (BRISBANE-UQIC, CANBERRA, DAVIS).

Distribution.—Fig. 28.

Etymology.—This species is named after its collection locality the Iron Range; *ferrus* = iron, *icolus* = loving, Latin, masculine.

Discussion.—The most distinctive features of this species in the male are the cupped foretrochanter, basally carinate forefemur and long midfemoral tooth. Male coloration is very similar to that of *cardalae*, as discussed under that species.

***Leiothynnus linnis* Kimsey, new species**
(Figs. 2, 17, 20, 22, 24, 25, 27)

Male.—Body length 8–10 mm; punctuation as in *cardalae*. *Head*: flagellomere I

length $1.5\times$ as long as broad; flagellomeres II-III $2.2-2.4\times$ as long as broad. *Thorax*: scrobal sulcus U-shaped, ventral part weakly defined; foretrochanter convex in cross section; forefemur evenly convex basally, without carina, knob or other modification; midtrochanter unmodified, midfemur projecting basoventrally in right angle; mid- and hindcoxa inner margins broadly rounded, not angulate. *Abdomen*: hypopygial apex subtruncate, with strong medial projection (Fig. 22). *Genitalia* (Fig. 25): paramere arcuate, broadly rounded apically, broadest subapically. *Color*: body black with yellow markings: head black with yellow clypeus, yellow along inner eye margin and between and across antennal lobes; scape, pedicel and basal flagellomeres red; rest of flagellum dark brown; pronotum black, with yellow transverse anterior band and band along posterior margin; scutum with short yellow band adjacent to tegula; mesopleuron with subalar yellow spot and small yellow spot above midcoxa; mesopleural lamellae translucent with yellow margins; scutellum and metanotum with large medial yellow spot; propodeum with large lateral yellow marks, narrowly separated medially; trochanter and femoral base dark brown, femoral apices and rest of legs reddish orange; tergum I orange with transverse subapical yellow marks becoming darker basomedially, tergum II brown with broad transverse medial yellow band; tergum III-IV black without small yellow spot laterally; tergum V-VI yellow anteriorly, with narrow blackish posterior band, or black with yellow lateral spot (tergum V may also be entirely black); tergum VII brown becoming paler apically.

Female.—Body length 5–7 mm. *Head* (Fig. 2): slightly broader than long, strongly indented laterally above eye; vertex somewhat concave medially; genal area between mandible and oral fossa deeply longitudinally sulcate. *Thorax* (Fig. 17): pronotal disk abruptly elevated above collar, concave anteriorly; scutellum about

twice as broad as long, propodeum broad, slightly convex dorsally, nearly planar between petiolar socket and scutellum, strongly rounded laterally in dorsal view. *Abdomen*: tergum I with broadly W-shaped transverse sulcus; tergum II with four large transverse ridges; tergum V apicomediaally emarginate; tergum VI with narrow parallel-sided carina-edged medial plate with lateral upturned flanges, apical part subtended by long dense tuft of setae (Fig. 20); sternum VI apicomediaally notched, separated into two halves, by long ventral groove, with long brush of setae laterally, and shorter brush apicomediaally (Fig. 24). *Color*: dark reddish brown.

Type material.—Holotype ♂: Queensland, Brisbane, March (BRISBANE). Paratypes: 29 ♂♂, 8 ♀♀, same data as holotype; 1 ♂, 8.5 km sse Dayboro, $27^{\circ}16'S$ $152^{\circ}52'E$ (BRISBANE, DAVIS).

Distribution.—Fig. 27.

Etymology.—The species name, *linnis*, is a nonsense combination of letters and is assumed to be masculine.

Discussion.—The color and general appearance of this species are similar to *cardalae*. However, *linnis* can be immediately distinguished in the male by the unmodified forefemur and small basoventral angle on the midtibia, and in the female by the peculiarly modified head and ventrally divided apical abdominal sternum.

Leiothynnus mackayensis (Turner)

(Figs. 7, 14, 27)

Thynnus mackayensis Turner 1908:123. Lectotype male (designated by Kimsey & Brown 1993); Australia: Qld., MacKay (LONDON).

Male.—Body length 9–10 mm; punctuation as in *cardalae*. *Head*: flagellomere I $1.5\times$ as long as broad; flagellomere II $2.5\times$ as long as broad; flagellomere III $3\times$ as long as broad. *Thorax*: scrobal sulcus U-shaped, ventral segment well-defined; foretrochanter convex in cross section; forefemur deeply cupped ventrobasally (Fig. 14); midtrochanter unmodified, mid-

femur with basoventral tooth, nearly as long as tarsal claw; midtrochanter unmodified; mid- and hindcoxae inner margins broadly rounded, not angulate. *Abdomen*: hypopygium strongly exerted, apex apically rounded, with strongly sclerotized medial tooth. *Genitalia*: paramere arcuate, rounded apically (as in Figs. 25, 26). *Color* (Fig. 7): body black with yellow markings: head black with yellow clypeus, yellow along inner eye margin and between and across antennal lobes; mandible yellow, becoming reddish brown apically; scape, pedicel and flagellomere I red; rest of flagellum dark brown; pronotum with yellow transverse anterior band and posterior lobe adjacent to tegula yellow; mesopleuron with subalar yellow spot and large yellow spot above midcoxa; scutellum and metanotum with large medial and smaller lateral yellow marks; propodeum with large lateral yellow marks, narrowly separated medially; trochanters and most of femora dark brown, femoral apices and rest of legs reddish brown; terga I and III-IV black with small apicolateral yellow spot; tergum II with large lateral yellow spots nearly meeting medially; terga V-VII black; sternum black, although sternum II often with small yellow apicolateral spot; wing membrane yellow-tinted.

Female.—Unknown.

Material examined.—Australia: Qld, Dunk Is. and Mackay; 5 ♂♂ were seen including the lectotype.

Distribution.—Fig. 27.

Discussion.—Male *mackayensis* share their dark coloration with *spinigerus*, although unlike *spinigerus* this species has a yellow band across the propodeum and tergum II. *L. mackayensis* males can be readily distinguished from *spinigerus* and other species by the combination of the basally cupped forefemur (shared with *multimaculatus*), and strongly dentate midfemur (shared with *ferriculus* and *spinigerus*).

Leiothynnus multimaculatus Kimsey,
new species
(Figs. 11, 27)

Male.—Body length 11 mm; punctuation as in *cardalae*. *Head*: flagellomere I 1.5× as long as broad; flagellomere II 2.2× as long as broad; flagellomere III 2.5× as long as broad. *Thorax*: scrobal sulcus U-shaped with ventral part weakly defined; forefemur with deep U-shaped basoventral impression, with associated longitudinal carina (similar to Fig. 12); foretrochanter unmodified; midfemur with short basoventral tooth, one half or less as long as tarsal claw (Fig. 11), adjacent area on trochanter flattened; mid and hindcoxae without sharp inner margin, evenly rounded not angulate. *Abdomen*: hypopygium slightly flattened apically on either side of medial spine. *Genitalia*: as in Figs. 25, 26. *Color*: black with yellow and orange markings; clypeus mostly yellow; antennal lobes and subantennal sclerite yellow; inner eye margin with broad yellow band; mandible red with yellow basomedially; postocular margin with short yellow band; scape, pedicel and ventral surface of flagellomeres I-IV paler red; rest of flagellum black; pronotum with yellow band along posterior margin; mesopleuron with large yellow subalar spot; mesopleural lamella with whitish stripe along inner margin; scutellum and metanotum with large medial yellow spot; propodeum with large lateral spots, broadly separated medially; coxae black becoming reddish dorsally on mid and hindlegs; femora dark brown to black, becoming red apically; tibiae and tarsi red (except hindtibia darkened subapically in holotype); terga III-IV black without lateral yellow spots; tergum VI black with small irregular medial yellow spot; tergum VII black; sternum I orange; sternum II orange becoming darker apically with yellowish lateral spot; sternum III-VI black.

Female.—Unknown.

Type material.—Holotype ♂: Queens-

land, Rockpool Gorge, Bluff Range, near Biggenden, 4 Oct. 1976, H. Frauca (CANBERRA). Paratype ♂, Bluff Range, Biggenden, 9–20 Dec. 1972, H. Frauca (CANBERRA).

Distribution.—Fig. 27.

Etymology.—The species name is derived from the multicolored male; *multus* = many, *maculatus* = marks, Latin, masculine.

Discussion.—The most distinctive features of this species in the male are the ventrally cupped forefemur, small basal midfemoral tooth and associated indentation on the midcoxa, red legs and red basal abdominal segments. *L. multimaculatus* most closely resembles *mackayensis* but can be distinguished by the more extensive yellow and orange coloration and smaller midfemoral angle (as in Fig. 11).

***Leiothynnus ochrotarsus* Kimsey, new species**
(Figs. 5, 6, 23)

Male.—Body length 11 mm; punctuation as in *cardalae*. *Head* (Fig. 5): flagellomere I $1.5\times$ as long as broad; flagellomere II length twice breadth; flagellomere III $2.3\times$ as long as broad. *Thorax*: foretrochanter convex in cross-section; forefemur basally indented with short longitudinal carina; mesopleuron with ventral part of scrobal sulcus obsolescent; midfemur basoventrally with slight angle or unmodified; midtrochanter unmodified; mid- and hindcoxae inner margins broadly rounded. *Abdomen*: epipygium with well-developed subapical transverse ridge; hypopygium broadly triangular apically (Fig. 23). *Genitalia*: as in Figs. 25, 26. *Color* (Fig. 6): head yellow, except frons medially, mandibular apex and occiput black; thorax yellowish orange, except anterior face of pronotum medially black, scutum black between notauli surrounding large medial yellow spot, mesopleural venter and propodeal base black; legs orange to yellow except base of coxae blackish; mesopleural lamellae translucent with yellow or whitish

margins; abdominal segment I orange becoming yellow laterally; abdominal segment II yellow with narrow dark brown posterior band; abdominal segment III black; tergum IV yellow, basally and apically with narrow black band; terga V-VII yellow with narrow basal black band; sternum IV-VII black with yellow lateral spot; parameres yellow; wing membrane yellow-tinted, except marginal cell darker, brownish.

Female.—Unknown.

Type material.—Holotype ♂: Queensland, 30 km w Collinsville, 12 Sept. 1950, E. F. Riek (CANBERRA).

Etymology.—*orchros* = yellow; *tarsus* = legs, Greek, masculine.

Discussion.—Male *ochrotarsus* can be distinguished by the bright coloration, forefemur with basal depression and associated longitudinal carina and unmodified midfemur. The apically triangular hypopygium may or may not be diagnostic as the holotype is an old individual with highly worn mandibles and the hypopygial apex may also be worn.

***Leiothynnus spinigerus* Turner**
(Figs. 1, 8, 13, 15, 19, 26, 27)

Leiothynnus spinigerus Turner 1912:534. Lectotype male (designated by Kimsey & Brown 1993); Australia: Stradbroke Is., Moreton Bay (LONDON).

Male.—Body length 9–12 mm; punctuation as in *cardalae*. *Head*: flagellomere I 1.3 – $1.4\times$ as long as broad; flagellomere II twice as long as broad; flagellomere III $2.4\times$ as long as broad; punctuation as in *cardalae*. *Thorax*: mesopleuron with ventral part of scrobal sulcus obsolescent; forefemur with basoventral knob or swelling, separated from longitudinal carina by indentation (Fig. 13); forecoxa convex in cross section; midfemur with long basoventral tooth, nearly as long as tarsal claw; midtrochanter flattened adjacent to femoral tooth; mid and hindcoxae inner margins rounded. *Abdomen*: hypopygium

strongly exserted, parallel-sided, apex rounded with long medial tooth. *Genitalia*: as in Figs. 25, 26. *Color* (Fig. 8): black, with yellow and red markings; head black with yellow band along inner eye margin, clypeal apical margin yellow, antennal lobes yellow; scape and pedicel reddish; flagellum dark brown to black; pronotum with short transverse anterior yellow band, band sometimes ending at lateral notch; mesopleuron may have subalar yellow spot; scutellum in some specimens with small medial yellow spot; mesopleural lamella translucent with white or yellow margins; metanotum with yellow medial spot; meso- and metapleuron with small pale spot above coxae; coxae, trochanters and midfemoral base and hindfemur and hindtibia brown, rest of legs red; abdomen black except small lateral spot on tergum I-II or I-IV; wing membrane yellow-tinted, becoming brownish in marginal cell.

Female.—*Head* (Fig. 1): vertex dorsally convergent and angulate, not evenly rounded; gena evenly rounded, without sulci or grooves; posterior margin behind eyes strongly convex in front view; clypeus narrowly truncate apicomediaally; mandible slender, broadest basally, edentate. *Thorax* (Fig. 15): pronotal disk broad-

ly quadrate, with scattered erect setae of irregular lengths, particularly along anterior margin; propleuron with ventral tuft of long setae on either side; scutellum about as long as broad; propodeum with broadly convex dorsal surface, planar with scutellum, flattened posteriorly, parallel-sided in posterior view, with erect setae particularly laterally. *Abdomen*: tergum V apicomediaally emarginate; pygidium with lateral carinae parallel-sided or diverging medially, subtended laterally by short flange and long tuft of setae; sternum VI apex hoof-like (Fig. 19).

Material examined.—Australia: Qld, Stradbroke Is., Brisbane, Bundaberg, and Bribie Is.; 17 ♂♂ and 3 ♀♀ were examined including the lectotype.

Distribution.—Fig. 27.

Discussion.—The coloration of male *spinigerus* is similar to that of *mackayensis*, but without the broad yellow bands or stripes seen in that species. Other diagnostic features of male *spinigerus* are the unmodified foretrochanter, forefemur with basal knob and longitudinal carina, and long midfemoral tooth. Females have a distinctively narrowed vertex, tufted propleuron, and pygidium subtended by a short flange.

KEY TO MALES OF THE SPECIES *LEIOTHYNNUS*

- 1 Forefemur basoventrally convex, without depression or ridge 2
- Forefemur with basoventral depression, often accompanied by short longitudinal ridge (as in Figs. 12–14) 3
- 2 Midfemur with small basoventral angle (as in Fig. 11); flagellum monochrome, brown or red *linnis* Kimsey, new species
- Midfemur without basoventral angle; flagellum bicolored red and black (or dark brown) *cardalae* Kimsey, new species
- 3 Forefemur with distinct longitudinal basoventral ridge and associated depression (as in Fig. 12) 4
- Forefemur with basoventral cuplike depression without longitudinal ridge (as in Fig. 14) 5
- 4 Foretrochanter strongly concave or cuplike in cross-section (Fig. 12); forefemur without knob or swelling adjacent to longitudinal basal ridge (Fig. 12); midcoxa inner margin angulate and sharp-edged *ferricolus* Kimsey, new species
- Foretrochanter convex in cross-section, unmodified; forefemur with knob or swelling adjacent to longitudinal basal ridge (Fig. 13); midcoxa unmodified *spinigerus* Turner

- 5 Forefemur with large basoventral tooth, tooth nearly as long as tarsal claw; petiole (basal two abdominal segments) black; tarsi red *mackayensis* (Turner)
 - Forefemur with short basoventral tooth, less than half as long as tarsal claw, or basoventrally rounded without tooth or angle; petiole primarily yellow or orange; tarsi pale yellow, red or brown 6
 - 6 Midfemur unmodified; tarsi pale yellow *ochrotarsus* Kimsey, new species
 - Midfemur with small basoventral tooth or angle (Fig. 11); tarsi red to brown
..... *multimaculatus* Kimsey, new species
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